ARCADIS

Infrastructure, buildings, environment, communications

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ENVIRONMENTAL

Mr. Mitch Cron
United States Environmental Protection Agency Region III
Hazardous Site Cleanup Division
1650 Arch Street
Philadelphia, PA 19103-2029

Subject:
Soil Vapor Sampling Summary, Bally Engineered Structures Facility,
Bally Borough, Berks County, Pennsylvania
ARCADIS Project No. NP000568.0004

Date:
5 May 2004

Contact:
Michael Bedard

Dear Mr. Cron:

ARCADIS, on behalf of American Household Inc. (AHI), has prepared the following soil vapor sampling summary that documents the March 31 and April 7, 2004 sub-slab soil vapor sampling events at the former Bally Engineered Structures (BES) facility (Figure 1). The intent of the investigation was to determine if site-related constituents, particularly trichloroethene (TCE), exist in soil vapor at concentrations that could potentially adversely affect indoor air quality. The scope of work was completed in accordance with ARCADIS's *Soil Vapor Sampling Workplan* dated October 21, 2004, the United States Environmental Protection Agency (USEPA) comment letter dated January 27, 2004, and subsequent e-mails and discussions between USEPA and ARCADIS that provided clarification to the scope of work.

The following sections provide the details and results of the soil vapor sampling events.

Field Activities

March 31, 2004 Soil Vapor Sampling Event

On March 31, 2004 ARCADIS met with representatives of the USEPA and Pennsylvania Department of Environmental Protection (PADEP) at the former BES facility to collect four sub-slab vapor samples (SV-1 through SV-4) from four locations within the facility. Sample locations are presented on Figure 1.

Samples SV-1, SV-3 and SV-4 were collected on March 31, 2004. Based on conversations with the EPA,the location of SV-2 was moved to the location shown on Figure 1. The new location was within one of two former test coolers currently used for private storage. The test coolers are constructed on a concrete slab with dimensions of approximately 12 feet by 40 feet. It was not possible to access the new location of SV-2; therefore, it was decided that SV-2 would be collected on a subsequent mobilization.

Soil vapor samples were collected according to the following protocol:

- The starting vacuum was determined for each 6 liter Summa Canister. All canisters were SIM certified by Air Toxics Limited of Folsum, California.
- Each Sample location was drilled using a 3/8" bit mounted on a cordless hammer drill. Cuttings from the hole were routinely removed from the top of the hole during the drilling process. Upon breaking through the bottom of the concrete slab, the area around the hole was cleared of cuttings and wiped clean with deionized water.
- The probe assembly was readied and the drill extracted from the hole.
- The proper length of insertion for the probe was determined from the drill bit and the probe was inserted into the hole. Care was taken to ensure that the probe did not contact the bottom of the hole.
- The top of the hole was sealed using canned dough (used because of its inert properties).
- Approximately two liters of soil vapor and air were then purged using an air-sampling pump capable of extracting 5 liters per minute. The purge volume was directed through an inline purge port.
- The valve connecting the purge port was closed isolating the summa canister and probe from the purge port. Next the valve on the Summa canister was opened slightly.
- Sub-slab air was drawn through the disposable stainless steel sample probe, into the Teflon tubing then through a 7-micron filter before entering the Summa canister.
- When air could no longer be heard moving into the canister, the valve was opened further to ensure that no residual vacuum was present in the Summa canister. The canister was then closed and disconnected from the sample probe.
- The final vacuum was then checked and noted for each canister and the canisters were prepared for shipment to the laboratory.
- Custody seals were then applied to the top of each box, per laboratory guidelines, and the outer box was sealed for shipment via overnight courier.
- The soil vapor samples were submitted to Air Toxics Limited for SIM analysis by TO-15 for the following compounds by GC/MS:

    - Vinyl Chloride
    - 1,1-Dichloroethane
    - 1,1-Dichloroethylene
    - cis-1,2,-Dichloroethylene
    - 1,1,1-Trichloroethane
    - Trichloroethylene

The PADEP checked each of these locations with a photo-ionization detector (PID) following sample collection. In all cases the PID reading was 0.0. Upon completion of sample collection, each hole was sealed with concrete caulk/sealant.

April 7, 2004 Soil Vapor Sampling Event

On April 7, 2004, after obtaining access to the former test coolers, soil vapor sample SV-2 was collected from the approximate center of the concrete slab underlying the coolers (Figure 1). The sample was collected using the same methodology discussed above. USEPA personnel were present for the collection of this sample. A PID was not used to monitor this location.

Results and Discussion

The four samples were submitted to Air Toxics for SIM analysis by TO-15 for vinyl chloride, 1,1-Dichloroethane, 1,1-Dichloroethylene, cis-1,2,-Dichloroethylene, 1,1,1-Trichloroethane, and trichloroethylene analysis. Two of the samples (SV-3 and SV-4) exhibited VOC concentrations in excess of the SIM instruments calibration range and were subsequently by the standard TO-15 methodology. The results of the analyses are presented in Table 1. In addition, the results are presented on Figure 1.

Level IV data deliverables were produced for the analyzed samples. The deliverables were validated by ARCADIS. The validation report will be provided under separate cover.

ARCADIS is in the process of evaluating these results. If you have any questions or comments regarding this sampling letter, please contact Michael Bedard at (267) 685-1821.

Sincerely,

ARCADIS G&M, Inc.

Christopher Sharpe
Scientist

Michael F. Bedard, P.E.
Project Manager

Attachments

Copies:
Ron Gahagan

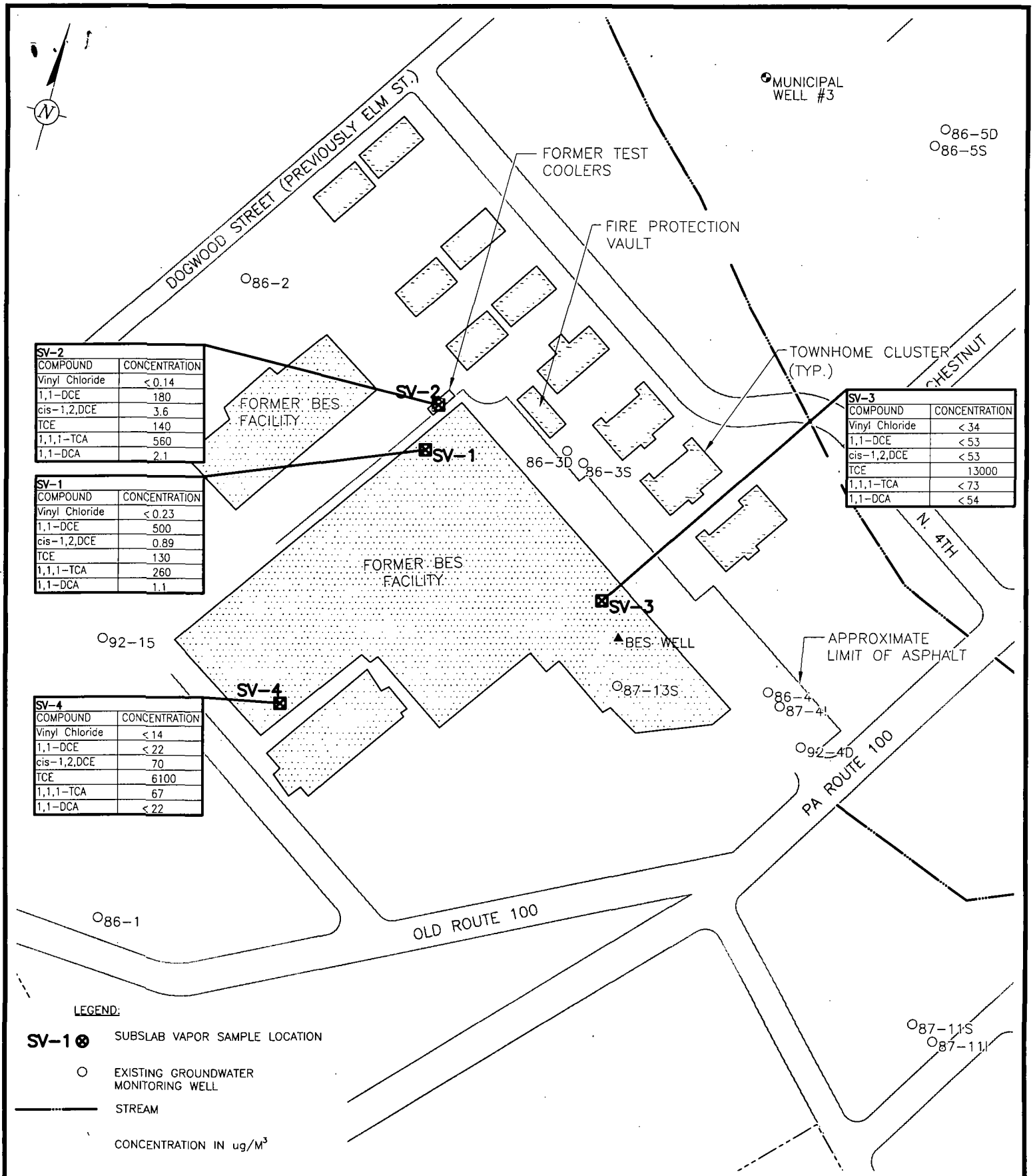
Table 1. Results of Sub-Slab Vapor Sampling, Former BES Facility, Bally, Pennsylvania.

Compound	Results			
	SV-1	SV-2	SV-3	SV-4
Vinyl Chloride	< 0.23	< 0.14	< 34	< 14
1,1-Dichloroethene	500	180	< 53	< 22
cis-1,2,Dichloroethene	0.89	3.6	< 53	< 22
Trichloroethene	130	140	13000	6100
1,1,1-Trichloroethane	260	560	< 73	< 67
1,1-Dichloroethane	1.1	2.1	< 54	< 70

Notes:

All units are in $\mu g/m^3$

< Less than specified value



SV-2

COMPOUND	CONCENTRATION
Vinyl Chloride	< 0.14
1,1-DCE	180
cis-1,2,DCE	3.6
TCE	140
1,1,1-TCA	560
1,1-DCA	2.1

SV-1

COMPOUND	CONCENTRATION
Vinyl Chloride	< 0.23
1,1-DCE	500
cis-1,2,DCE	0.89
TCE	130
1,1,1-TCA	260
1,1-DCA	1.1

SV-3

COMPOUND	CONCENTRATION
Vinyl Chloride	< 34
1,1-DCE	< 53
cis-1,2,DCE	< 53
TCE	13000
1,1,1-TCA	< 73
1,1-DCA	< 54

SV-4

COMPOUND	CONCENTRATION
Vinyl Chloride	< 14
1,1-DCE	< 22
cis-1,2,DCE	70
TCE	6100
1,1,1-TCA	67
1,1-DCA	< 22

0 200
SCALE: 1"=200'

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DRAWN	DATE	PROJECT MANAGER	DEPARTMENT MANAGER
M. WASILEWSKI	4/27/04		
SUBSLAB VAPOR SAMPLE RESULTS		LEAD DESIGN PROF.	CHECKED
BALLY GROUNDWATER CONTAMINATION SITE BALLY BOROUGH, BERKS CO., PA		PROJECT NUMBER NP000597.004	NUMBER 1

AR100261

G:\APROJECT\AH Bally, PA\CADD\VAPOR INTRUSION\FIG-1 VAPOR INTRUSION SUBSLAB SAMPLES _ACTUAL- WITH RESULTS.DWG 5/05/2004 - 3:37:32 PM Layout: 8.5x11 H